

Canada's Natural Systems

1.1 The Earth in Motion



In this Unit

- You will be able to show that you know some of Canada's important geographic patterns
- Understand that Canada is divided into different types of regions including bioregions and ecozones

In this Unit

- Recognize that Canada's regions have very different characteristics
- Understand how people and environment are linked together in Canada's regions

Can You Believe It

p. 22 Text

- Canada is home to some pretty strange landforms and weather, but don't be that all of the following statements are true. Take your best guess at the following questions

Building Mountains



The Earth in Motion: Continental Drift

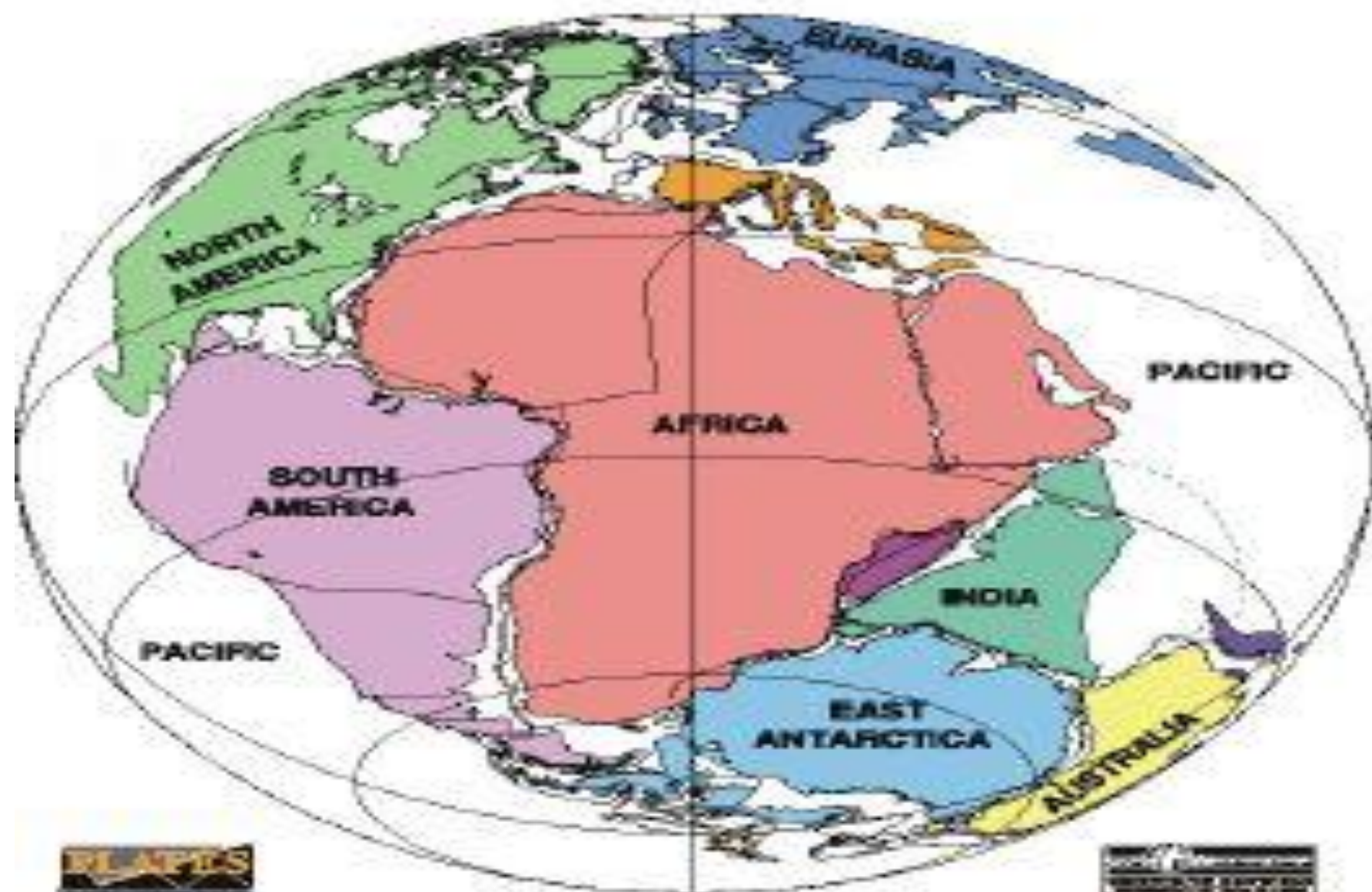
- If you cut out the continents on a world map, you would be surprised at how well some of them fit together
- Almost a century ago, German geographer Alfred Wegener noticed this pattern

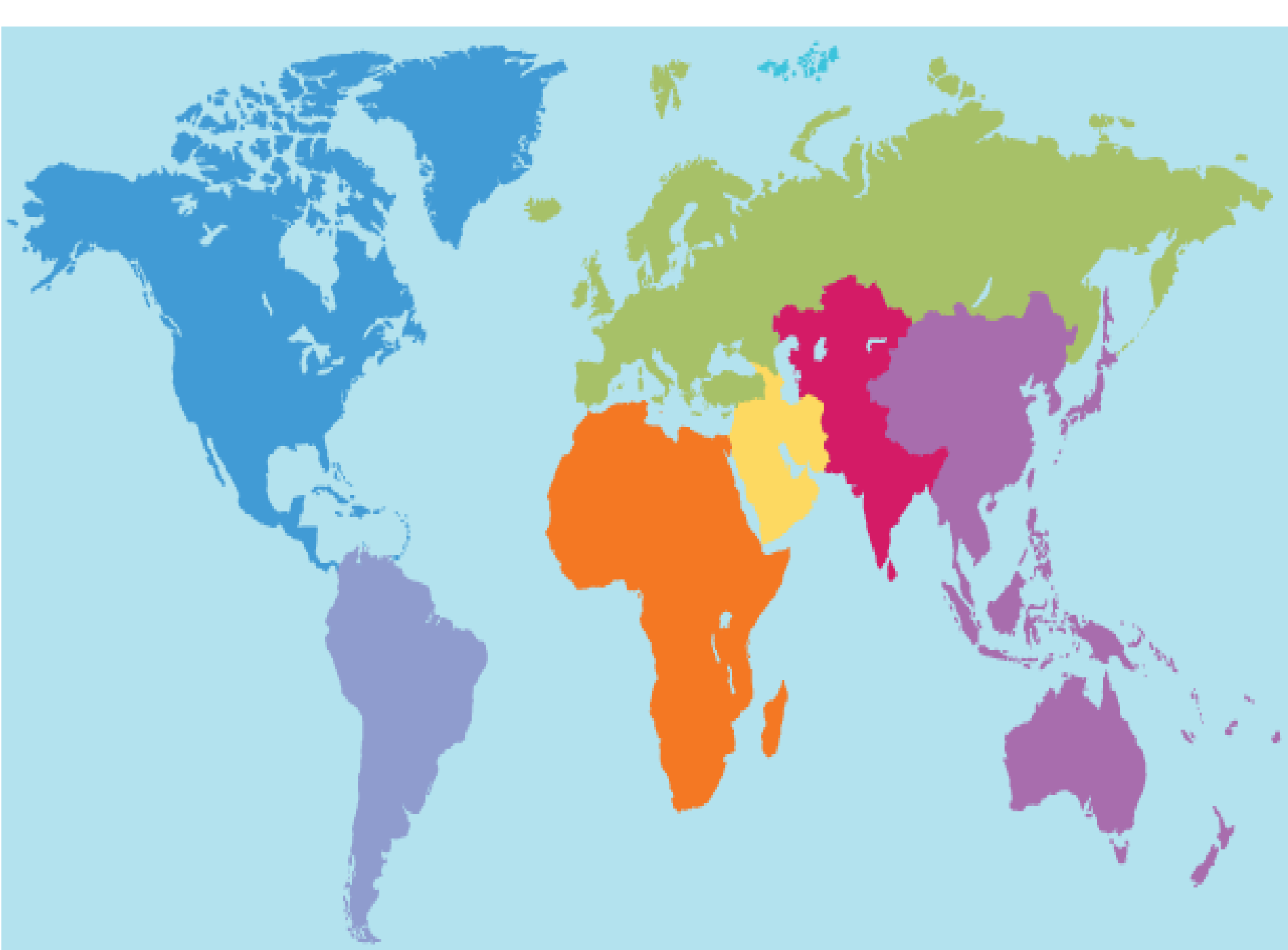
The Earth in Motion

Continental Drift

- Wegner believed that the continents had once been joined together in one land mass that he called **Pangaea** meaning “all lands”
- He proposed the theory of **Continental Drift** which suggests that the continents gradually moved away from one another over time.

PANGAEA





The Earth in Motion

Continental Drift

- Problem
- Wegner could not explain how massive continents could move across the face of the earth.
- Most scientists rejected the CD theory. Years later it turned out Wegner was right and it was a Canadian who helped discover the reason why

The Earth in Motion

Plate Tectonics

- Think of the earth as a round egg. Canada sits on the thin, brittle outer shell, called the **lithosphere**, or crust
- Beneath the lithosphere is the mantle, a zone of molten magma where you'd find the egg white.

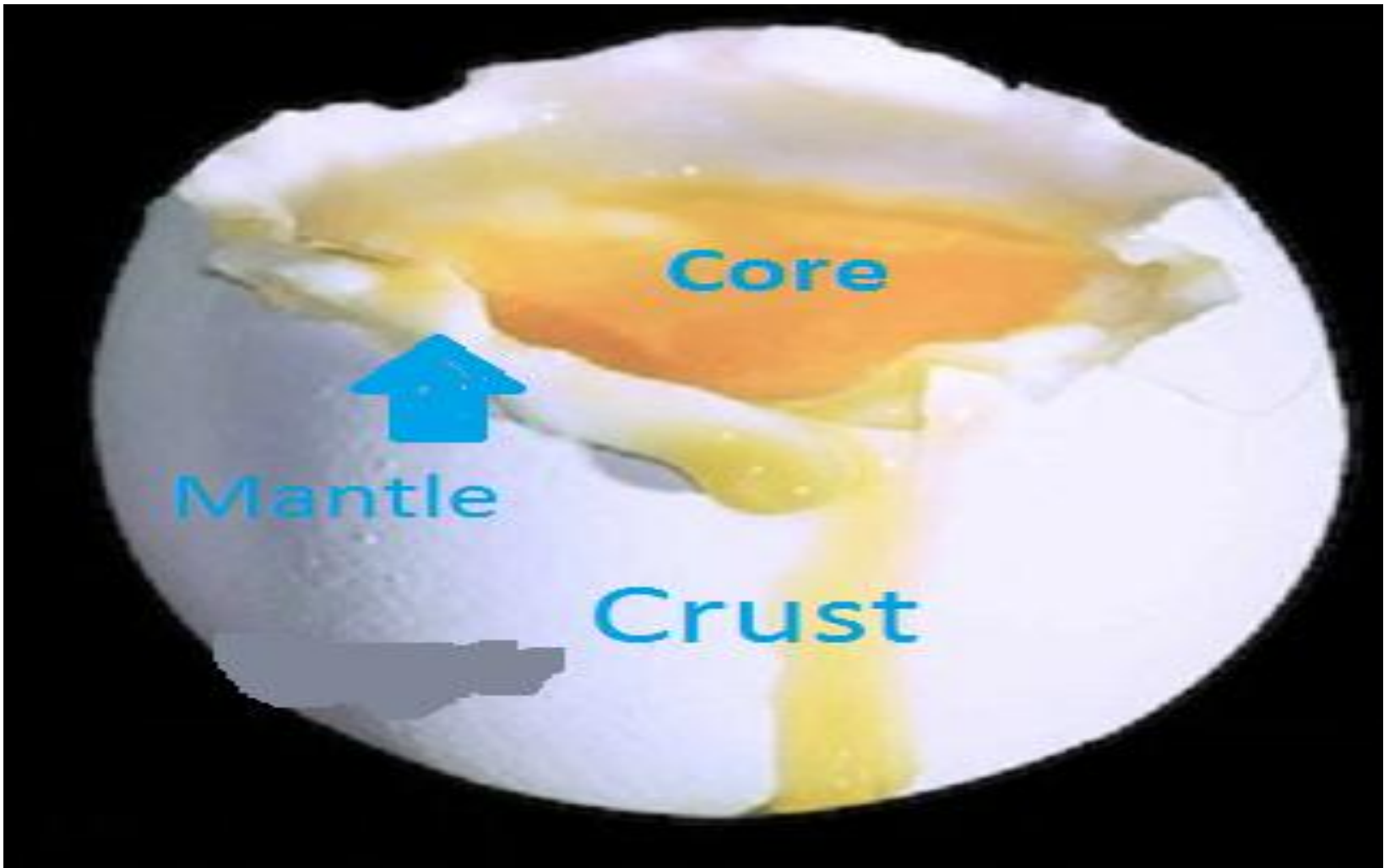
The Earth in Motion

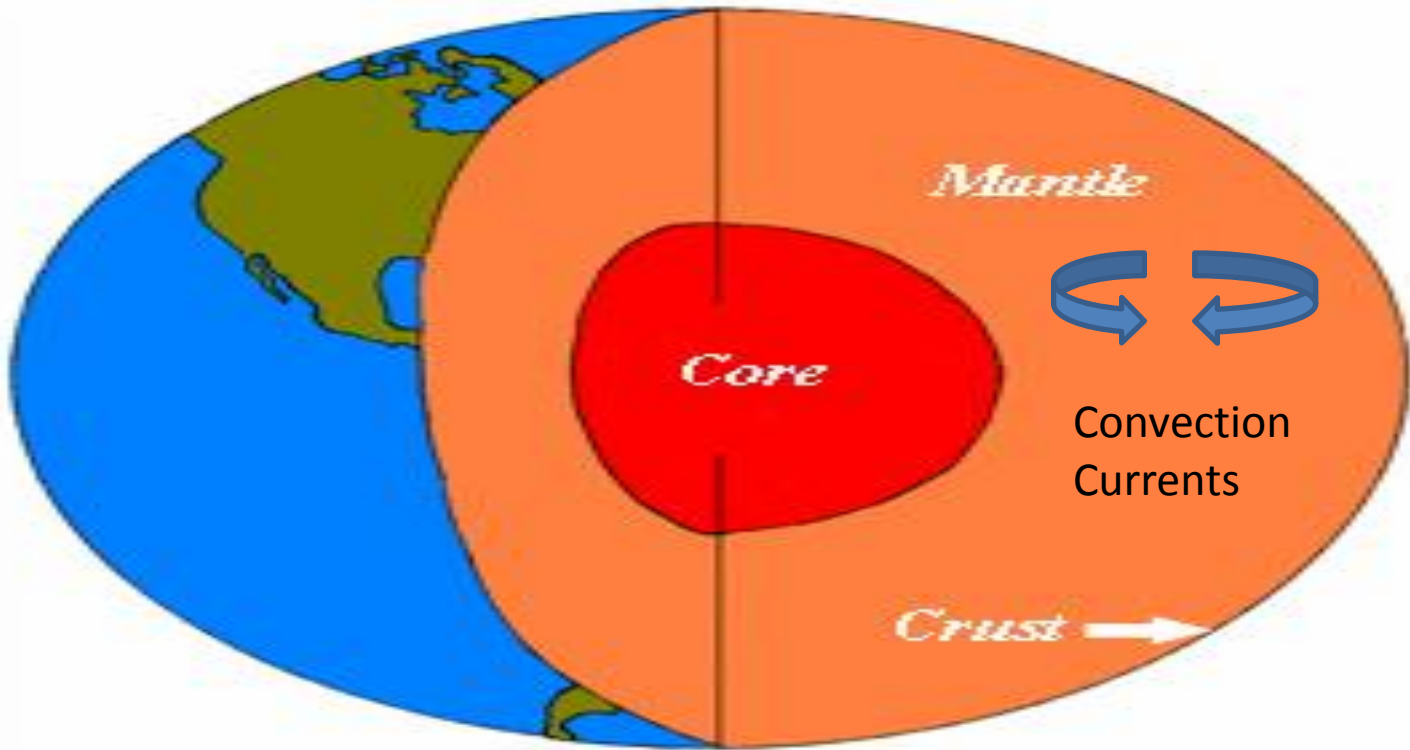
Plate Tectonics

- At the center, the earth's **core** is like the yolk.
- It is the nuclear furnace that melts the rocks of the mantle above it

The Earth in Motion

Plate Tectonics





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Plate Tectonics

- In the 1960's Canadian J. Tuzo Wilson recognized **hot spots** could form deep in the mantle and that currents could circulate above these hot spots
- Just like boiling water swirls in a heated pot on a stove



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Plate Tectonics

- These **convection currents** might provide enough force to push the crust apart, as Wegner suggested
- The field of plate tectonics investigates how moving plates can create volcanoes, build mountains, and trigger earthquakes.

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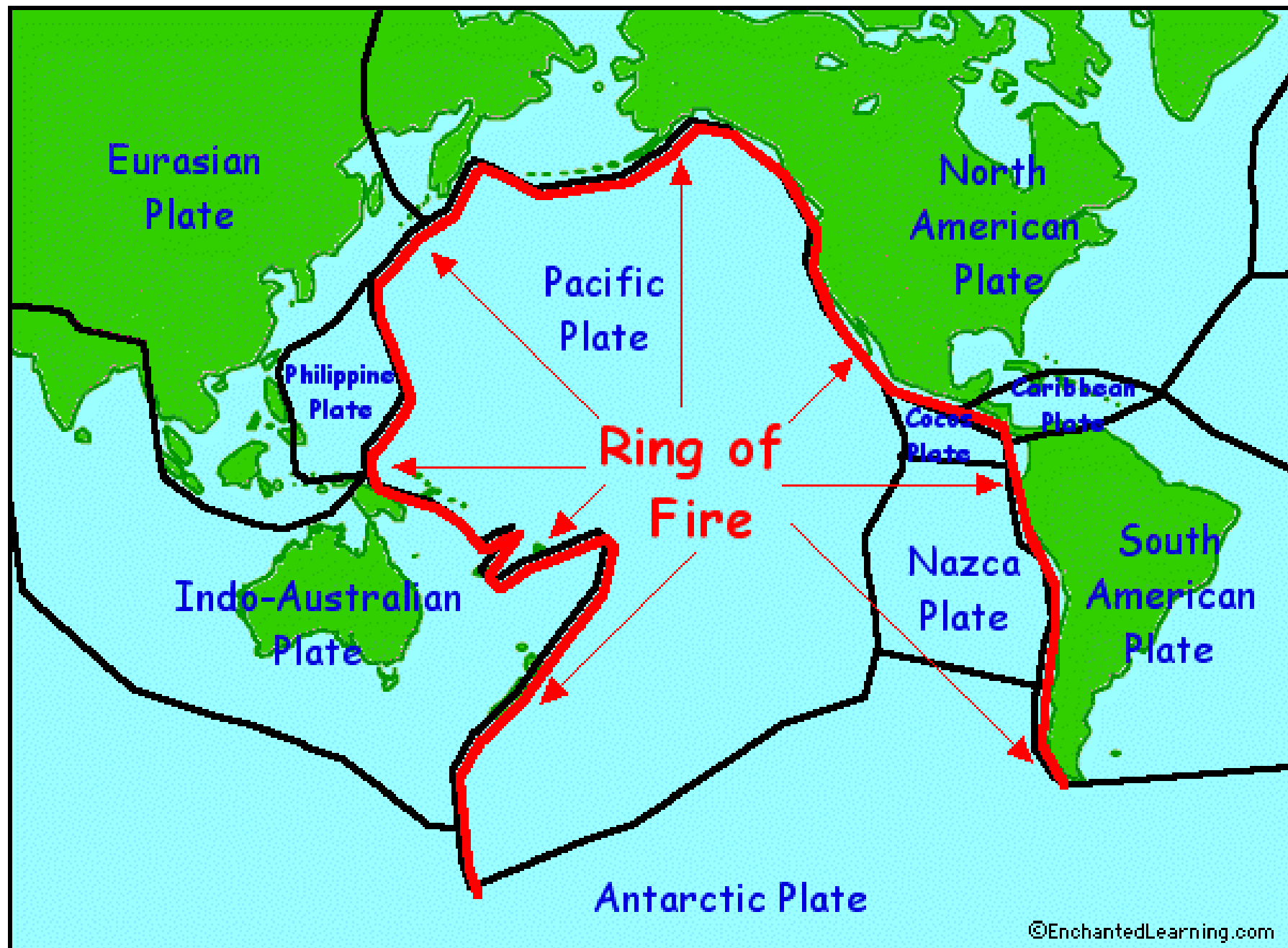
Volcanoes



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Volcanoes

- Canada has no active volcanoes, but some along the Pacific coast are classes as dormant (sleeping) volcanoes
- The West Coast volcanoes are part of the **Pacific Ring of Fire**, a global system of active volcanic mountains that circle the Pacific Ocean.



The Earth in Motion

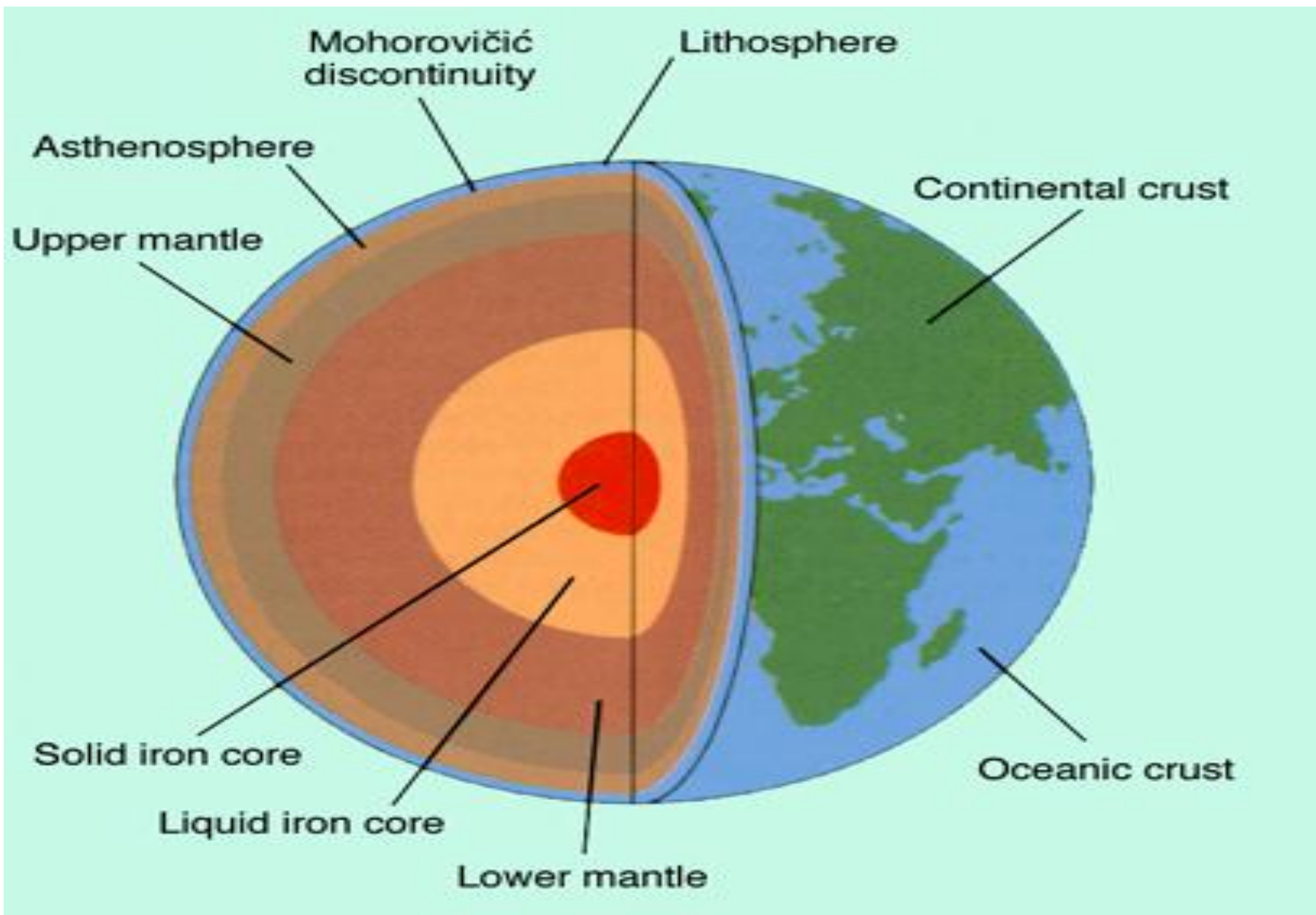
Volcanoes

- What causes volcanoes?
- Scientists believe there are “hot spots” in the earth’s core
- Rising heat sets the molten material of the mantle into huge circular motions, like warm air circulating in a room

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Volcanoes

- As the convection currents swirl, they drag the plates of the lithosphere with them
- Cracks open along the plate edges and magma forces its way through.



The Earth in Motion

Fold Mountains

- Paper/binder experiment
- The textbooks are like thick plates, carrying continents, while the paper represents soft sedimentary rock layers on an ocean plate
- Your arms are like convection currents dragging the plates together to build mountains

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Fold Mountains

- EX the Rocky Mountains were folded by the collision of the Pacific and North American Plates.
- Diagram page 25 text.